

**IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE**

**TITLE:
A COOKER AND SMOKER APPARATUS
AND METHOD OF SMOKE GENERATION,
RECIRCULATION, AND EXHAUST**

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BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[01] Applicant's invention relates generally to the field of preparing foodstuffs for consumption. More specifically, Applicant's invention relates to the field of imparting wood-smoked flavors and aromas to meat during the process of warming or cooking.

BACKGROUND INFORMATION

[02] The general field of smoking foodstuffs and the specific field of barbecue are rich with disclosure and invention. The public domain is replete with barbecue techniques, mainly because the public has been charring meat for consumption since man discovered fire.

10 [03] Perrine (4,232,597) discloses a first airtight enclosure for smoking food. A second airtight
11 enclosure, a smoke generator, is also disclosed. The second enclosure is separable and portable from
12 the first enclosure, and the two communicate with each other through a common gasketed opening
13 through which smoke generated in the second enclosure passes into the first enclosure for the
14 purpose of imparting desired flavor and aroma to foodstuffs in the first enclosure without
15 discharging smoke into the room in which the enclosures are situated. Perrine discloses the use of
16 wood chips and dust and pellets and pills made of compacted wood dust as combustibles in the
17 smoke generator. Electric or gas-fired heating elements or canned heat provide sufficient energy to
18 burn the small combustibles with high efficiency. Perrine discloses the use of a timer to control
19 burner cycles for efficient energy use. As a benefit of low temperature smoking, Perrine realizes
20 decreased dehumidification of the cooking environment and decreased dehydration of the foodstuffs.

1 Perrine's invention permits food such as cheese and nuts, and food that is pre-cooked, to be smoked
2 without the application of high temperatures.

[04] Cothran (4,474,107) discloses a double oven that permits independent cooking and smoking, controlled with timers and thermostats, that is enhanced with electric heating elements and a unique natural convection flow design. Kelly (4,669,447) discloses a combination smoker and convection cooker the smoke circulation of which is enhanced with forced convection created by an electric fan. Kelly also claims a rotating knife apparatus that automatically and periodically scrapes the charred face of a wood block that, when heated by electric means, is the smoke source.

9 [05] Cox (4,700,618) discloses a meat smoker having an internal smoke path damper and air inlet
10 and outlet regulators that permit an operator to manually adjust the natural convection airflow that
11 controls cooking temperature and smoke circulation. Glanton (5,078,049) discloses a barbecue
12 smoker having a damper for regulating the volume and path of air into the combustion chamber, and
13 a sensor for monitoring conditions in the cooking chamber. Cross (5,704,278) claims a high
14 capacity rotary oven that operates at high efficiency due to a forced convection air circulation
15 system. Anders (6,142,066) discloses a combination smoker and convection oven. Bollich
16 (6,167,797) discloses a portable commercial forced air barbecue cooker that uses saw dust as the
17 smoke-producing combustible.

SUMMARY OF THE INVENTION

19 [06] Applicant enhances the field of food smokers with his novel combination cooker and smoker
20 and his novel method of generating, recirculating, and exhausting smoke. Applicant achieves
21 efficiency greater than that of existing food smokers with the use of forced convection and an air

1 path utilizing multiple dampers, one or more of which is double-acting. Applicant's invention of a
2 vibrating means that continuously feeds fuel such as wood disks into one or more heating elements
3 permits unattended smoking. The efficiency of Applicant's invention decreases the amount of fuel
4 required for smoke generation, fuel storage costs, the amount of time required for smoking, and
5 labor costs.

6 [07] The present invention provides a novel apparatus that will smoke and cook food.

7 [08] The present invention further provides:

8 [09] a. a control panel that allows the user to set cooking time and temperature, by
9 controlling the controlling one or more of the ambient temperature of the cooking enclosure, the
10 ambient temperature of the combustion chamber, the temperature of the foodstuffs, the heat source
11 power, the vibrator power, the fan speed, the duration of the cooking or smoking process, the
12 position of the first damper, the position of the second damper, the timer, the thermostat, and servo
13 motors;

14 [10] b. a recirculating duct system that uses less smoke than conventional smokers to
15 continually immerse the food in smoke and also reducing the amount of fuel units needed; and

16 [11] c. a vibrating fuel unit holder upon which fuel units are placed, the vibrator feeds the
17 fuel units to keep them in contact with the heat source, maximizing the amount of smoke produced
18 from a minimum of fuel units.

19 BRIEF DESCRIPTION OF THE DRAWINGS

20 [12] Figure 1. is a perspective view of the present invention.

21 [13] Figure 2. is a front view of the present invention.

- 1 [14] Figure 3. is a full sectional side view of the present invention along plane X-X with the ducts
2 sets for smoking foodstuffs.
- 3 [15] Figure 4. is a full sectional side view of the present invention along plane X-X with the ducts
4 sets for venting smoke from the cooking enclosure.
- 5 [16] Figure 5. is a full sectional front view of the present invention along plane Y-Y.

6 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

7 [17] Referring to the figures, Figure 1. illustrates one embodiment of Applicants' combination
8 cooker and smoker 100 for cooking foodstuffs that uses novel devices and methods of generating,
9 distributing, recirculating, and exhausting smoke. It shows the control panel 1, the cooking
10 enclosure 16 with the cooking enclosure doors 2 open. The cooking enclosure 16 provides a
11 compartment for placing foodstuffs during the cooking or smoking process. The cooker and smoker
12 100 control panel 1 provides a user (not shown) with the ability to monitor and control the cooker
13 100 by controlling one or more of the ambient temperature of the cooking enclosure 16, the ambient
14 temperature of the combustion chamber 11, the temperature of the foodstuffs (not shown), the heat
15 source 15 power, the vibrator 6 power, the fan 12 speed, the duration of the cooking or smoking
16 process, the position of the first damper 17, the position of the second damper 18, the timer (not
17 shown), the thermostat (not shown), and servo motors (not shown) that cause the various moving
18 parts of the cooker/smoker 100 to move. A controller 9 on the control panel 1 provides the user (not
19 shown) with the mechanism to set these characteristics. With the cooking enclosure doors 2 open,
20 the food racks 3 are exposed. The open access door 4 provides a view of the floor of the combustion
21 chamber 11, and the vibrator 6. Fuel units are supplied through fuel door 5. Storage door 8 provides

1 access to a grease drain valve (not shown). At or near the bottom of the combustion chamber 11 is
2 an ash bin 7 for easing the collection and removal of ashes generated.

3 [18] Figure 2 is a front view of Applicant's cooker and smoker 100 with the cooking enclosure
4 doors 2, the fuel drawer 5, and the storage door 8 all closed. The smoker 100 may be placed on
5 rollers 24 in order to ease movement, or it can be placed directly on a floor.

6 [19] Figure 3 is a sectional side view complete with arrows indicating airflow paths during the
7 cooking and smoking operation. First damper 17 is shown as it is positioned in a first position when
8 smoke is being recirculated in the cooking enclosure 16. First damper 17 is shown as it is positioned
9 in a second position, to evacuate smoke, in dashed lines. Second damper 18 is shown in a first
10 position, closed to block the influx of outside air 19. Figure 3 shows inlet air 10 being induced into
11 combustion chamber 11 by fan 12, passing over fuel units 14, such as wood pieces or charcoal, that
12 have been loaded onto a fuel unit holder 13. The fuel unit holder 13 is anticipated to be any of a
13 rack, shelf, tray, pan, basket, or the like. The vibrating action of the fuel unit holder 13 feeds the fuel
14 units 14 into heat source 15. The heat source 15 can be powered by electricity, gas, liquid fuel, or
15 any means of generating energy. Vibration is provided by a vibrator 6, whose vibration may be
16 powered by a source such as electric, magnetic, or liquid fuel. The vibrating may be by hydraulic
17 solenoid action., asymmetrical shaft rotation, or any other means capable of imparting a periodic or
18 random reciprocating motion. The vibration, acting in concert with gravity, assures that some
19 surface area of the fuel unit 14 is in operative association with the heat source 15. Vibration also
20 tends to continuously cause the charred surfaces (not shown) of the fuel unit 14 to break apart and
21 fall into ash bin 7, exposing unpyrolyzed portions of the fuel unit 14 into operative association with
22 the heat source 15. Thus, the heat source 15 is in operative association with the vibrator 6.

1 [20] Combustion of the fuel unit 14 by the heat source 15 creates smoke that is induced into first
2 duct 21 by fan 12. The fan 12 and first duct 21 direct the smoke to the cooking enclosure 16 where it
3 impinges the foodstuffs (not shown), imparting heat, flavor, and aroma as it is recirculated into the
4 fan 12. The fan 12 may be any suitable air moving device. First damper 17 is generally a double-
5 acting damper so that it can preferably provide efficiency and compact design by providing a desired
6 airflow path in either of its extreme positions. Second damper 18 acts as a closure device and is
7 generally a single-acting damper. Proper positioning of the dampers 17 and 18 assures recirculation
8 of the hot air and smoke. As positioned in Figure 3., the dampers 17 and 18 direct the smoke into a
9 recirculation path through cooking enclosure 16. Recirculation of the smoke is maintained until
10 cooking is terminated and the smoke is vented from the cooker 100. If using the controller 9, a timer
11 may signal when an operator-selected thermostatically-controlled cooking enclosure temperature is
12 reached for a selected amount of time. Heat source 15 and vibrator 6 are generally turned off when
13 cooking and smoking are complete. Heating element 23 may also be incorporated into the
14 circulation path of the hot air and smoke. The heating element 23 may be used to maintain a desired
15 temperature or re-heating the air and smoke as it circulates.

16 [21] Figure 4 is a sectional side view complete with arrows indicating airflow direction. When
17 dampers 17 and 18 are positioned as shown in Figure 4, the airflow assumes a cleansing
18 configuration. First damper 17 is shown in a second position to evacuate smoke and hot air from the
19 cooking enclosure 16. The second damper 18 is shown in a second position to admit fresh air 19.
20 The residual smoke in the cooking enclosure 16 and first duct 21 is induced into fan 12, along with
21 inlet air 10 and fresh air 19, all of which is vented through the second duct 22 and exhaust 20. In

1 this manner, a relatively short amount of time is necessary to cleanse the cooking enclosure 16 of
2 smoke and hot air.

3 [22] Figure 5 is a sectional front view indicating airflow passing through first duct 21, from the
4 combustion chamber 11, to fan 12, to the cooking enclosure 16. It further shows the relationship of
5 the fuel unit holder 13, the vibrator 6, and the ash bin 7.

6 [23] Although the invention has been described with reference to specific embodiments, this
7 description is not meant to be construed in a limited sense. Various modifications of the disclosed
8 embodiments, as well as alternative embodiments of the inventions will become apparent to persons
9 skilled in the art upon the reference to the description of the invention. It is, therefore, contemplated
10 that the appended claims will cover such modifications that fall within the scope of the invention.

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